SF 2.1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

October 24, 1995

In Reply
Refer To: HW-113

Mr. Robert L. Geddes
Senior Environmental Engineer
Monsanto Chemical Company
P.O. Box 816
Soda Springs, ID 83276

Subject: Monsanto Remedial Investigation/Feasibility Study

Dear Mr. Geddes:

This letter responds to several issues raised in your September, 1995, monthly report for the Monsanto Soda Springs Superfund Site Remedial Investigation (RI) and Feasibility Study (FS). It also responds to the October 8, 1995, letter from Golder Associates, Inc., requesting (on your behalf) a change in the groundwater sampling program for the site.

As your report noted, the revised Development and Screening of Remedial Alternatives memorandum was submitted to EPA and on September 13, 1995, a conference call was held to discuss it. On September 29, 1995, EPA approved the revised DSRA with changes. On October 11, 1995, we held a conference call to discuss the changes and how Monsanto would proceed to complete the FS. On October 17, 1995, EPA received a letter from Monsanto discussing how the changes will be reflected in the Phase III FS. The preliminary responses in that letter appear acceptable, although it seems Monsanto will be providing far more information than requested or required by EPA.

The project schedule in your report is consistent with our discussions on the October 11, 1995 conference call. I have reserved EPA Conference Room 12B from 1:30 to 4:30 PM on Thursday November 9, 1995, for the Comparative Analysis Report Presentation by Monsanto. The Phase III FS Report is due to EPA by December 5, 1995. The only other outstanding item I am aware of is submittal of the complete RI report, which should accompany or precede the FS. Please advise EPA at your earliest convenience of your current plan for submission of the RI.

Your report also notes EPA's commitment to provide comments on the Stochastic Risk Assessment (SRA) performed by Monsanto and requests those comments as soon as possible. **Enclosed** are

comments which describe the results of EPA's review and comparison of Monsanto's SRA to the Baseline Risk Assessment (BRA) required in the NCP. Note that EPA's review and comments focussed on how the SRA compared to and could be used in conjunction with the BRA to make remedial decisions. EPA did not exhaustively review the calculations and numerical results of the SRA, since the differences in assumptions limited their utility in any event.

As we have said many times, EPA will consider the results of Monsanto's SRA in making remedial decisions at this site. As we have also said, the SRA would have been easier to use and more useful if it had followed EPA Region III's guidance on use of Monte Carlo Risk Analyses where appropriate and started with assumptions that were consistent with the ones used by EPA in the BRA. Instead, the assessment deviates from both the Region III guidance and EPA's site-specific assumptions in ways that significantly restrict the utility of the document. Nonetheless, EPA will make what use it can of the SRA in making remedial decisions.

As to the other topics in your report, we should discuss the Sediment Sampling Analysis and Dust Suppressant Demonstration Projects further once the responses and additional information referenced in your report are submitted.

In addition, EPA is in receipt of the October 8, 1995, letter from Golder Associates referenced in your report, which requested a change in the groundwater sampling program. Specifically, the letter proposes that no fall monitoring of groundwater wells, surface water, and springs be performed and that future monitoring be reduced to a yearly schedule. It also proposes reductions in the number of wells to be sampled and the constituents to be analyzed during future events.

Monsanto's request to eliminate the fall, 1995 monitoring event is approved. However, while the proposal for future groundwater monitoring seems reasonable based on the RI results, no action will be taken on that request at this time since future monitoring requirements will be addressed in the Record of Decision (ROD) anticipated this Winter. If the ROD is not completed before the end of March, 1996, Monsanto should resubmit its proposed monitoring program for consideration and use during the Spring of 1996. EPA assumes this request provides the details of the future groundwater monitoring program that is being evaluated and costed as part of the FS alternatives. If that is not the case, further explanation should be provided to EPA.

Finally, enclosed for your information are uncertified summaries of the estimated oversight costs for the period 1/1/94 - 12/31/94, and to date this year. The oversight billing was delayed while EPA removed some costs which should not have been charged to Monsanto. You should expect to receive the billing

and certified cost summaries for 1994 soon. Costs incurred in calendar year 1995 will be billed as soon as possible in 1996.

If you have any questions about this letter or the enclosures please call me as soon as possible at (206) 553-2100.

Sincerely,

Timothy H. Brincefield
Superfund Site Manager

Enclosures

cc: Gordon Brown, Idaho Department of Health and Welfare
Andy Hafferty, Ecology and Environment
David Banton, Golder Associates
William Wright, Montgomery Watson

Enclosure 1

Review of Monsanto's Stochastic Risk Assessment
for the Monsanto Soda Springs Idaho Superfund Site

The purpose of this document is to provide a brief review of Monsanto's stochastic risk assessment (SRA) and summarize the differences in assumptions and approach between the risk assessments performed by Monsanto/Montgomery-Watson and EPA/SAIC. In addition, differences in the results derived from the risk assessments are summarized. The following documents were reviewed:

- Baseline Human Health and Ecological Risk Assessments for Monsanto Chemical Corporation Superfund Site, Soda Springs, Idaho. Drafted by Science Applications International Corporation (SAIC) for EPA, Region 10, January 1995; and

- Monsanto Company. Stochastic Baseline Risk Assessment for the Soda Springs Elemental Phosphorous Plant, Idaho, April 1995.

A brief comparison of the SAIC and Monsanto risk assessments is presented in the attached tables; the comparisons of methodologies and results are presented in Tables 1 and 2, respectively. Numerous differences were found in the exposure assumptions employed by Monsanto, compared to those used by EPA.

EPA Region III's guidance entitled "Use of Monte Carlo Simulation in Risk Assessment" (February 1994) was also considered. Although the SRA presented by Monsanto represents a technically innovative approach, this document does not conform to the requirements of Monte Carlo analyses specified in Region 3's guidance. Consequently, the utility of this SRA in contributing to the remedial decision-making process is limited. Specific comments on the SRA are presented below.

Executive Summary

Please note that the comments provided on this section are also applicable to subsequent sections of the SRA. However, these comments are not repeated for the sake of brevity.

- The assertion that "the deterministic point estimate of risk is often so overly conservative as to be completely unrealistic" is unwarranted, since this statement merely reflects personal bias and offers no real insight into the issue. Such statements are inappropriate in a technical document.

- The statement that "The deterministic risk assessment conducted for EPA-10 estimates material-specific ILCRs of about 10^{-4}" is misleading. While this assertion is true for the current industrial scenario; ILCRs for the future industrial scenario were approximately 10^{-3}.

- The assumption that "current operational conditions at the plant provide the best approximation of future working conditions" is not sufficiently health protective and does not conform to EPA, Region 10 guidance.

- Focussing the SRA on current residential exposure to arsenic is not health-protective, because this metal accounted for only 55% of the total risk. Beryllium and cadmium also made significant contributions to site risk under this scenario and should be included in the analysis.

- The statement that "the EPA-10 assessment estimates ILCRs [for the current residential scenario] of about 10^{-5}" is incorrect. As shown in Table 5-6 of the EPA-10 risk assessment, all current residential ILCRs for the ingestion/external radiation exposure pathways are below background, with the single exception of ingestion of metals at the Current Southern location (ILCR $=8 * 10^{-6}$).

- Table 1 should be revised to more accurately reflect the results of the EPA risk assessment.

- The bulletted statements that begin "Which method of analysis -- conservative deterministic modelling ..." are inflammatory and inappropriate for such a technical document.

Part 1. Problem Formulation

- This section consistently refers to the wrong tables in the EPA-10 risk assessment. ILCRs for the industrial and residential scenarios are presented in Tables 5-3 and 5-6, respectively. The tables cited in this SRA present absolute risks, rather than incremental risks.

- The use of bioavailability factors to adjust arsenic dose and toxicity to an absorbed-dose basis is not consistent with EPA, Region 10 guidance.

Part 2. Analysis

- Modifying toxicity values for arsenic and ^{222}Ra to account for bioavailability and dose-rate effectiveness, respectively, does not conform to EPA, Region 10 or Region 3 guidance. Region 3 guidance dictates that the variability in risk estimates should be due entirely to the exposure assumptions.

- EPA, Region 3 recommends that peer-reviewed literature and site-specific data should be used for the input probability distributions. Consequently, the use of maximum entropy inference is questionable; Region 3 recommends the following: "Use professional judgement only as a last resort, and only in the form of a triangular or uniform distributions."

- The rationale underlying the derivation of exposure assumptions and selection of exposure point concentrations was not reviewed in detail due to the complexity of these sections and the limited utility of the document.

Part 3. Risk Characterization

- Considerable uncertainty is associated with the risk estimates presented in this section, reflecting the issues described in the preceding sections.

Enclosure 1 (cont)

Table 1

COMPARISON OF HUMAN HEALTH RISK ASSESSMENT METHODOLOGIES
MONSANTO SUPERFUND SITE

Issue	EPA/SAIC	Monsanto/Montgomery-Watson
Approach		
General	Deterministic - used point estimates of input variables.	Stochastic/probabilistic - used probability distributions of input variables.
Guidance	Conforms to EPA, Region 10 guidance.	Diverges from EPA, Region 10 guidance in several respects (see below).
Exposure Assessment		
Exposure Assumptions	Evaluated ingestion, inhalation, and external radiation for each exposure scenario.	Focused only on the most significant exposure pathway, as determined from the EPA risk assessment (i.e., external exposure to $^{226}Ra+D$ or ingestion of arsenic.
Bioavailability	100% bioavailability of arsenic assumed for soil (residential scenarios), relative to that intrinsic to the study from which the toxicity value was derived.	Adjusted exposure calculation to account for reduced bioavailability of arsenic in soil.
Current Occupational Scenario	Risks evaluated for potential exposures to each source material using site-specific point estimates derived from time-and-motion data provided by Monsanto. Evaluated risks associated with all COPCs (i.e., metals and radionuclides) and all potential exposure pathways.	Modeled potential risks for a person selected at random from the permanent, full-time workforce. Focused on external exposure to gamma radiation from $^{226}Ra.+D$.
Future Occupational Scenario	Assumed that the Monsanto facility would close. Future occupational risks associated with each source area were calculated using modified EPA, Region 10 RME assumptions.	Assumed that future exposure conditions are the same as those currently occurring.

Table 1

COMPARISON OF HUMAN HEALTH RISK ASSESSMENT METHODOLOGIES
MONSANTO SUPERFUND SITE

Issue	EPA/SAIC	Monsanto/Montgomery-Watson
Current Residential Scenario	Estimated potential risks from point locations proximal to the Monsanto facility. Evaluated risks associated with all COPCs (i.e., metals and radionuclides) and all potential exposure pathways.	Modeled potential risks for a person selected at random from the current residential population. Focused on incidental ingestion of arsenic in soil (accounts for 55% of risk in EPA RA).
Future Residential Scenario	Estimated potential risks from point locations proximal to the Monsanto facility. Evaluated risks associated with all COPCs (i.e., metals and radionuclides) and all potential exposure pathways.	Modeled potential risks for a person selected at random from a future residential population. Focused on external exposure to gamma radiation from $^{226}Ra+D$.
Gamma Risks	Evaluated risks associated with worker exposure to gamma radiation.	Exposure to gamma radiation not evaluated.
Toxicity Assessment		
Toxicity Values	Used values directly from IRIS or HEAST.	Modified slope factors for arsenic and $^{226}Ra+D$ to account for high-dose to low-dose extrapolation uncertainties. Modified slope factor for $^{226}Ra+D$ for occupational scenarios

Enclosure 1

Table 2

COMPARISON OF HUMAN HEALTH RISK ASSESSMENT RESULTS
MONSANTO SUPERFUND SITE

	EPA/SAIC	Monsanto/Montgomery-Watson
Current Occupational Scenario	Metals risks ranged from 1×10^{-6} (Treater Dusts) to 3×10^{-5} (Underflow Solids). Radionuclide risks ranged from 7×10^{-5} (Treater Dusts) to 5×10^{-4} (Slag).	95th percentile risk for external exposure to ^{226}R-a+D = 4×10^{-5}.
Future Occupational Scenario	Metals risks ranged from 2×10^{-6} (Treater Dusts) to 5×10^{-5} (Underflow Solids). Radionuclide risks were 1×10^{-3} at all areas except Nodules and Slag (2×10^{-3}).	95th percentile risk for external exposure to ^{226}R-a+D = 4×10^{-5} (future exposures assumed to be the same as current).
Current Residential Scenario	Ingestion risks were below background for metals, at all areas except Current Southern (8×10^{-6}). Inhalation risks for metals ranged from 1×10^{-6} to 4×10^{-6}. Ingestion and external radiation risks were below background for radionuclides at all areas. Inhalation risks for radionuclides ranged from 8×10^{-7} to 8×10^{-6}.	95th percentile risk for ingestion of arsenic = 2×10^{-8}.
Future Residential Scenario	Ingestion risks for metals ranged from 4×10^{-6} (Future Southern II) to 1×10^{-4} (Future Northern I). Inhalation risks for metals ranged from 6×10^{-7} (Future Northern II) to 1×10^{-5} (Future Northern I). Ingestion and external radiation risks for radionuclides ranged from below background (Future Southern II) to 2×10^{-3} (Future Northern I).	95th percentile risk for external exposure to ^{226}R-a+D = 4×10^{-7}.
Gamma Risks	Current occupational external gamma radiation risks ranged from 1×10^{-4} to 7×10^{-4}. Future occupational external gamma radiation risks ranged from 5×10^{-4} to 3×10^{-3}.	Not evaluated.

NOTE: All risks are incremental excess lifetime cancer risks.

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CERTIFIED BY FINANCIAL MANAGEMENT OFFICE

ITEMIZED COST SUMMARY REPORT
MONSANTO - SODA SPRINGS, SODA SPRINGS, ID SITE ID = 10-D4

REVISED COST PACKAGE
FROM 01/01/94 THROUGH 12/31/94

REGIONAL PAYROLL COSTS	$ 36,228.12
HEADQUARTERS PAYROLL COSTS	0.00
EPA INDIRECT COSTS	71,659.50
REGIONAL TRAVEL COSTS	3,129.73
HEADQUARTERS TRAVEL COSTS	0.00
ALTERNATIVE REMEDIAL CONTRACT SUPPORT (ARCS)	
ECOLOGY AND ENVIRONMENT, INC. (68-W9-0020)	74,787.38
CONTRACT LAB PROGRAM	
FINANCIAL COST SUMMARY	419.79
OTHER EXPENDITURES	
AGENCY FOR TOXIC SUBSTANCES & DISEASE (ATSDR)	15,591.40
ARMANDO BUSTAMANTE (9450HP0384)	19.66
CARIBOU COUNTY SUN (94AV0114)	100.00
FEDERAL EXPRESS CORPORATION (8U4001NBLX)	12.90
SODA SPRING HIGH SCHOOL (9410NE0502)	100.00
STATE COOPERATIVE AGREEMENT (SCA)	
IDAHO DEPT OF HEALTH & WELFARE (V00053902)	4,589.00
IDAHO DEPT OF HEALTH & WELFARE (V00053901)	15,731.00
TECHNICAL ENFORCEMENT SUPPORT (TES) CONTRACT	
SCIENCE APPLICATION INTERNATIONAL CORP. (68-W9-0008)	94,669.57
TOTAL SITE COSTS:	$ 317,038.05

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REPORT DATE: 10/23/95

FINAL IFMS RECONCILIATION PENDING

ITEMIZED COST SUMMARY REPORT
MONSANTO - SODA SPRINGS, SODA SPRINGS, ID SITE ID = 10-D4

COSTS FROM 01/01/95 THROUGH 09/30/95

REGIONAL PAYROLL COSTS	$	20,964.66
HEADQUARTERS PAYROLL COSTS		669.37
EPA INDIRECT COSTS		37,072.20
REGIONAL TRAVEL COSTS		1,422.01
HEADQUARTERS TRAVEL COSTS		0.00
ALTERNATIVE REMEDIAL CONTRACT SUPPORT (ARCS)		
ECOLOGY AND ENVIRONMENT, INC. (68-W9-0020)		26,767.91
ENVIRONMENTAL SERVICES ASSISTANCE TEAMS (ESAT)		
ICF TECHNOLOGY INCORPORATED (68-D1-0135)		56.80
MISCELLEANOUS EXPENSES (MIS)		51,417.56
STATE COOPERATIVE AGREEMENT (SCA)		
IDAHO DEPT OF HEALTH & WELFARE (V00053902)		8,971.00
TOTAL SITE COSTS:	$	147,341.51